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Let's Talk About It:

Number Crunchers and Semi-Super Computers

Gentle Reader, let's explore the subject of computationally intensive problems (what a mouthful!), or number crunching. There is a somewhat *ad hoc* group on campus who have been exploring the possibilities of a supercomputer at the University of Toronto. At the same time, a few groups on campus, as well as we at UTCS, have been evaluating an attached processor system known as the FPS-164. To quote Floating Point Systems, the manufacturer's description, "it is designed for low-cost processing of large-scale scientific and engineering applications. This Scientific Computer provides a powerful combination of very high-speed 64-bit computation and large memory. With the host computer maintaining overall control, computationally-intensive jobs are offloaded to the FPS-164, which executes them while the host computer is performing other operations. The FPS-164 is programmed using an optimizing FORTRAN-77 Compiler. Additional performance may be obtained by the use of an extensive library of FORTRAN-callable matrix, simulation and mathematical subroutines."

Other than the obvious hyperbole and the relative degree of some of the adjectives, the description is pretty accurate. The FPS-164 is attached to another computer (IBM or VAX) and acts as a stand-alone back-end processor. The system is not what we all have in mind when we talk about supercomputers, and we should not let the possibility of acquiring one sidetrack longer term efforts for a really large, powerful machine. However, the FPS system could provide relatively inexpensive number crunching for a while and let us explore the nature and degree of the demand.

A newly announced feature for the FPS-164 is the ability to add additional processors

called MAXs (Matrix Accelerators), each of which can potentially add twice as much computational power as the original nominal 11 Megaflop (million floating point operations per second) FPS-164. Adding the first one costs about \$100K, but each additional one after that costs only about \$30K. Up to 15 MAX processors may be added, for a potential 341 Megaflops total. It should be emphasized that the performance of a highly specialized machine like the FPS-164/MAX is very dependent on the type of problem it is processing, and is probably best at matrix calculations or anything amenable to parallel processing or intensive pipelining.

Guelph has an FPS-164 (no MAX attachments) hosted by an IBM 3081D, and Queen's is in the process of acquiring one. Guelph have benchmarked theirs against the IBM 3081 system in a number of modes. They indicate that for a general FORTRAN program optimized a bit, the FPS-164 is about 1.5 or 2 times as fast as the 3081D. In this context the 3081D is about equivalent to our 3033, since any program on the 3081 uses only one of the two processors available.

For "vectorized" routines which allow one to replace

```
5 DO 10 I = 1,N
10 B(I) = SIN (A(I))
```

by the subroutine call

```
CALL VSIN (A, 1, B, 1, N)
```

The gain in performance over a 3081D is a factor of 4 or 5.

The 164 runs FORTRAN-77 programs. It uses a host-resident cross compiler, with five levels of optimization.

continued...

Let's Talk About It continued

We want to find out whether there is enough potential business for such a machine to cover its costs on a continuing basis. Guelph's system is utilized 80% of the time, but we do not know exactly what that means, since it is owned by a consortium. Analysis shows that we would have to charge about \$1.00 per minute for hardware, software and support personnel if the machine were utilized 50 percent of the time. Any usage above the 50 percent level would let us either upgrade the system

further, lower the rates, or both. An enhanced system (the base 164 and two MAX boards) would be equivalent to from 7 to 25 3081s, for appropriate types of problems. Seven equivalent 3033 minutes (rather than 25) at Class E rates would be about \$5.60. You would have to analyze your computations carefully and optimize to get the full benefit, but for heavy computational jobs it could be at least a first step toward a better solution. Anyone interested?

Warren Jackson

Announcing NetNorth

NetNorth is a computer network connecting a number of Canadian universities and colleges. Previously known as OUNET, it is very similar to several other networks:

ERN (European Research Network)

BITNET (Because It's There NETwork)

VNET (the IBM corporate network)

All of these are file transfer networks, i.e., they are designed for copying files of data.

NetNorth offers three ways of communicating with other NetNorth members.

1. File Transfer

One can send a program to a fellow researcher at another university. That person could look at the program, use it, maybe even improve upon it and send it back. Data or text can be transmitted as easily as a program. Papers could be submitted electronically for evaluation, editing, or publication. This might be particularly useful in fields where publication delay is short and deadlines tight.

2. Conversation

NetNorth supports a limited form of line-at-a-time typed conversation,

rather similar to TOPS-10's SEND command or UNIX's write(1) command. It works only if both parties are signed on at the same time. Users accustomed to SEND or write(1), will know that these commands are adequate only for short, simple interchanges; more wide-ranging conversations are difficult. Clearly, this facility will never replace the telephone, but it is quite handy for conveying specific information.

3. Shared Hardware

Some machines which might be useful at an academic site may be simply beyond its means or cannot be justified by a large enough demand. Supercomputers, phototypesetters, laser printers, colour plotters, and some special input devices are examples. Through NetNorth, one university site would run the machine, and other sites would send files of data to be processed there. Machine readable results could be sent back electronically, while physical output could be sent via the Inter University Transit System (I.U.T.S.). Mutual arrangements would be made by the cooperating

continued...

Announcing NetNorth continued

computer centres to simplify the billing procedures. The FPS unit at Guelph (see "Let's Talk About It") was purchased by a consortium of users at Waterloo and Guelph who share it using the same technology.

UTCS is currently investigating two "network services": we are considering offering service on the new 8700 Laser Printer to other sites, and we are looking into providing U of T users with access to supercomputers installed at other sites.

NetNorth may be used to communicate only with people who have interactive computer accounts on machines connected to the network.

The machines currently connected to the network are listed in Table 1. Table 2 lists other Canadian sites interested in joining NetNorth. We do not have firm joining dates for any of them yet. When these dates are established, they will be reported in *COMPUTERNEWS*.

In addition, the NetNorth administrators are currently trying to arrange a connection to BITNET. Because of the technical similarity between BITNET and NetNorth, a connection would yield the appearance of a single network. There are nearly 200 machines on BITNET, representing over 100 different universities and research centres. A list of these institutions will be printed here should the NetNorth-BITNET connection be confirmed.

At present, UTCS is only offering NetNorth access via an experimental CMS service (see "What are VM and CMS?" elsewhere in this issue). Users participating in this CMS pilot project have used NetNorth to exchange programs with people at other universities. We are not yet in a position to run a full CMS service. However, for those who need to access NetNorth now, we can offer a limited service, sufficient for accessing the network. Users interested in this offer should contact Michael Wagner (978-6602) for details.

CMS is the only UTCS service for which the full complement of NetNorth support software is currently available. Certain other services could be supported, with some effort, if demand warranted it. UTCS is not certain how best to deploy its limited resources in this regard and is seeking input from users. If you have comments, please speak to me or to the administrator of your system.

Table 1

Current NetNorth Members

<i>Institution</i>	<i>Place</i>	<i>Machine Name</i>	<i>Operating System</i>
Queen's University	Kingston	QUCDN	VM/CMS
Queen's University	Kingston	QUCIS	UNIX
McGill University	Montreal	MCGILL1	VM/CMS
Waterloo University	Waterloo	WATDCS	VM/CMS
Waterloo University	Waterloo	WATCSG	UNIX
Waterloo University	Waterloo	WATMATH	UNIX
Waterloo University	Waterloo	WATROSE	UNIX
Waterloo University	Waterloo	WATDAISY	UNIX
Waterloo University	Waterloo	WATCGL	UNIX
Waterloo University	Waterloo	WATDCSU	UNIX
University of Guelph	Guelph	UOGUELPH	VM/CMS
University of Guelph	Guelph	UOGVAX2	UNIX
York University	Toronto	YORKVMI	VM/CMS
University of Toronto	Toronto	UTORONTO	VM/CMS
Ryerson P.I.	Toronto	RYERSON	VM/CMS
Humber College	Toronto	HUMBER	VM/CMS
University of Ottawa	Ottawa	UOTTAWA	VM/CMS

Table 2

Potential NetNorth Members

McMaster University	Hamilton, Ontario
Concordia University	Montreal, P.Q.
Carleton University	Ottawa, Ontario
University of Windsor	Windsor, Ontario
University of Manitoba	Winnipeg, Manitoba
Laurentian University	Sudbury, Ontario
Lakehead University	Thunder Bay, Ontario
University of Western Ontario	London, Ontario

Michael Wagner

continued...

TOPS-10 Version 7.02 Is Here

UTCS has just received version 7.02 of TOPS-10, the latest upgrade of the operating system which runs on our DECsystem-10. Conversion to the 7.02 monitor is scheduled for July 24.

Digital's major reason for this release is to support fully the corporate networking protocol DECnet-10 phase III. For the time being at least this functionality is of no use at UTCS. However, 7.02 contains many performance enhancements, including a software implemented disk cache for monitor I/O, provisions for large disk buffers (up to 31*128 words/buffer), and a rewrite of the swapping algorithms to increase swapping throughput. In addition, there are a number of new features intended to enhance the system's "user friendly" reputation.

Here is a list of the most important new 7.02 features:

- Several utility programs have had maintenance releases. These include LOGIN, SYSTAT, INITIA, CREDIR, SYSDPY, FILCOM, PFH and GLOB. Users are referred to the help files for these programs for additional information.
- Users may now individually define their own commands. The command will run any program selected by the user. This feature is supported by the new DECLAR program.
- The TTY PAGE command has been superseded by the TTY STOP, TTY XONXOF, and TTY LENGTH commands. The new command TTY SSTOP n has been implemented to suspend output unconditionally after "n" lines of output.
- The functionality of FILDAE has been enhanced. It will also record additional information in a user's ACCESS.LOG file.
- It is now illegal to give the CLOSE com-

mand a disk-like device for an argument (as in "CLOSE DSK:"). This never did work; the system just didn't complain before. Note that a CLOSE command with no arguments will correctly close all DDBs (including disks).

There are also a number of known deficiencies of which a few users may need to be aware. They are:

- The system occasionally fails to "XOFF" after n lines of output. That is, the monitor will fail to suspend terminal output automatically. This effect can also be caused by terminals which themselves generate XOFF/XON sequences (each XON resets the page counter). LA120, VT61, and VT100 terminals are subject to this condition.
- Video screen editing may be incorrect when TTY NO DEFER is set. If you have declared your terminal as a video terminal by using the TTY TYPE command, and you have set TTY NO DEFER, and you try to type ahead, you may encounter the following problems:
 - The TTY TYPE command no longer sets the "stop" (after n lines) parameter. TTY TYPE now only sets "hardware" parameters such as LENGTH, WIDTH, XONXOF. If you want your terminal to suspend output automatically, you must use the TTY STOP/SSTOP command.
 - The 7.02 monitor deletes characters (from the screen image) by using a fill sequence. That is, when you delete characters with the DELETE key or with CTRL/W, the characters are replaced by the following sequence: backspace, space, backspace. If you type ahead while in TTY NO DEFER mode, the monitor may receive a second DELETE or CTRL/W before it has finished the sequence for the first. When this happens, the screen

continued...

TOPS-10 continued

is not correctly erased. It may look like there are more characters to delete when, in fact, they have been deleted from the monitor's buffers. To see the correct screen image, type CTRL/R; however, note the next item.

- When the monitor reprints the line with CTRL/R or deletes the line with CTRL/U, it ignores the prompt at the beginning of the line. It does this by "remembering" the position, on the line, of the last character output to the terminal. If you attempt to type ahead while in TTY NO DEFER mode, the characters you type may become interspersed with the prompt. The position that the monitor "remembers" as the last prompt space, will be wrong in

this case. If you attempt to use CTRL/R or CTRL/U on this line, your *terminal* will show that either too many or too few characters have been affected. The monitor, however, will be correct. That is, CTRL/R and CTRL/U will always affect the whole line except the prompt.

To eliminate these problems, use the TTY DEFER command to put your terminal in TTY DEFER mode. Thus, your terminal will echo typed-ahead characters after current functions are accomplished.

Edmund West

Spring DECUS

The Spring '84 DECUS was held in early June. Highlights will be published in the next issue of *COMPUTERNEWS*, but in-

terested users may read a detailed account online now. (See DOC:DECUS.DOC)

General Purpose UNIX Timesharing in the Fall

The present SAS/DPS UNIX service is operated by UTCS partly to support the SAS Statistics group, and partly for sale to other users. Effective September 1984, this system will be available for the exclusive use of the Statistics group, while a new UNIX timesharing service will be offered to the general university computing community.

Initially, the new system will run the 4.2BSD version of UNIX, a powerful timesharing operating system. The UNIX system has a number of attributes which make it easier to use than conventional operating systems. For example, it has a powerful command language, a tree-structured file system, and a wide range of utilities that work together. As a result, the system has attracted considerable attention

over the last few years and is widely used in business and research around North America and the world.

UNIX can be run on machines as small as the IBM PC and as large as the Cray-1, so that once you have learned the system, you may use it productively on a large range of computers.

The UTCS GP/UNIX timesharing facility will consist initially of a Digital Equipment Corporation VAX-11/750 with two disk drives, one tape drive, several megabytes of memory and at least as many terminal lines as are available on the present UNIX service.

A document is in preparation describing changes to be faced by current UNIX custo-

continued...

General Purpose UNIX continued

mers moving to the new service. Please note that applications written in "C", FORTRAN, or other languages will need to be recompiled. However, most programs should need only minimal programming changes.

Anyone with an application based on or suitable for use on UNIX is invited to explore the possibility of using this new ser-

vice. Please call Advising Services 978-HELP.

We think that GP/UNIX will be a major step forward for UTCS and look forward to helping you use UNIX to make your computing easier.

Ian Darwin

The 8700 Laser Printer: A Look at the Machine

In early September 1984, UTCS will bring into production a new highspeed printer: the Xerox 8700 Laser Printer. Two IBM 1403 line printers will be replaced in this upgrade of service. Printing will become less expensive while a greater variety of output styles, types and fonts will be offered. This new service can be tested by users from August 27 through September 9, 1984. It is expected that full production will begin on September 10. (See "The 8700 Laser Printer: User Test" later in this issue of *COMPUTERNEWS*.)

UTCS users have primarily used line printers and computer forms for their output printing. In 1981, the 9700 Printing Service was initiated, making available an alternative form of printing. This service, because of its cost and turnaround time, was mainly a method of obtaining a higher quality output with variable fonts and profiles. The acquisition of the 8700 Laser Printer now allows UTCS to offer extended profiles and fonts, as well as user-supplied setups, with much faster turnaround at a much lower cost.

The 8700 Laser Printer prints 70 single-sided pages per minute. This machine obviously surpasses the line printer's maximum 1000 lines per minute. Users will be able to replace their bulky 11 x 15 inch standard forms with 8.5 x 11 inch white paper and print up to four times as much information per sheet. This is possible because the 8700 can print both simplex and duplex

(one-sided and two-sided respectively) with either one or two page images per side of paper. Obviously, the type size for printing two page images per side will be smaller than that for one page image per side; it can reduce the amount of paper used by up to 75 percent and cut the output cost as well. Simplex printing on the 8700 will cost approximately five cents per sheet of paper.

Using the 8700 will be as easy as using the line printer. On September 10 all 8700 printing will be routed to destination CENTRAL as the default. The standard setup will be 8.5 x 11 inch paper without holes, duplex (two-sided) printing, portrait layout and .50 inch margin. Unique forms codes have been established for the 8700. These include both line printer and 9700 equivalents, as well as new options not previously available. User-supplied setups can also be arranged. (See "The 8700 Laser Printer: How to Use It" later in this issue.) Detailed information on the 8700 can be found in the new "UTCS Guide to Highspeed Printing" available at the UTCS Information Office.

The 8700 Laser Printer combines computer, laser and xerographic technology in the production of high quality output at high speed. The techniques of the 8700 printing process are different from those used in other printing devices. Most line printers such as the IBM 1403 are "impact" devices where printing is caused by the contact, or impact, of inked symbols on the paper. The

continued...

8700 Laser Printer continued

8700, on the other hand, uses a laser beam to "paint" an image on a drum. The painted image is then copied on to the paper through a xerographic process.

The 8700 Laser Printer produces high quality images of near letter-quality. Output requiring high-contrast, even-quality printing will be produced best on the 8700. Final copies of theses, reports, manuscripts, or course notes are ideally printed on the 8700 because of both the quality of the printing and the convenience of the collated output. Three hole punched paper is also available. Exams, course assignments, or letters for mass mailings are other examples of documents which could be printed on the 8700.

If you require multipart forms (forms with carbon copies) or labels for your printed job, you will have to submit the job to the line printer. Label printing on the 8700 is being investigated but is not available at this time. Please remember that there will be only one 1403 line printer available for special forms line printing when the 8700 goes into full production. Turnaround time for the remaining line printer will be affected. Users who wish to continue to use a line printer for standard forms printing may also route their output to a line printer at a remote site.

Patricia Hood

The 8700 Laser Printer: Potential Enhancements

The 8700 Laser Printer, replacing two IBM 1403 line printers at UTCS, will offer a variety of fonts and profiles for printing when it is first put into production in September. Users will be able to print up to four page images of text per sheet of paper using either landscape or portrait orientation, and the cost will be less than output from the conventional line printers. The 8700 Laser Printer will replace the 9700 Printing Service as well. The machine, however, is capable of much more. Some enhancements will be made to the service in the coming months, and others, though not yet scheduled for the service, will be investigated.

The SCRIBE formatting package (currently on the DECsystem-10) can prepare text to print in mixed fonts and sizes. Major headings and titles, examples, tables, and figures which are normally set off from the text, can be further distinguished by changes in font size or type. Output of such text is limited, however, by the ability of the printer to print mixed fonts and type sizes. UTCS intends to establish a connection between the 8700 and SCRIBE to make this type of printing available.

When SCRIBE becomes available on the IBM system, text can be formatted to produce pseudotypesetting on the 8700. This will provide a faster, less expensive alternative to the Varian and CAT phototypesetter. Output will be printed on cut sheet paper, eliminating the cutting and pasting required for current typeset material.

Some other capabilities of the 8700 which UTCS is looking into and which offer useful and creative enhancements to highspeed printing are forms flashing, graphics printing, and graphics merged with text. With forms flashing, users would be able to graphically design forms such as registration sheets or expense reports and have them printed by the 8700 as the actual output is printed. This capability would eliminate many user-supplied setups requiring pre-printed forms.

Another possible enhancement of interest to many users would be an ability to print graphics produced from environments and packages available at UTCS. Graphics merged with text would provide users with a complete manuscript preparation package. Graphs, charts, maps and tables, usually

continued...

Enhancements to 8700 continued

printed on the Gould or Calcomp plotters, could be printed on the 8700 instead. Graphics stored in files could be merged with formatted text and printed together in one run. Tables and figures in documents would be greatly enhanced; cutting and

pasting graphics and figures would be eliminated.

Patricia Hood

The 8700 Laser Printer: How to Use It

The 8700 Laser Printer is versatile and easy to use. Print jobs are submitted in the same way as for the line printer except that the forms codes are different for the 8700. During the User Test, (August 27 - September 9) users will be required to code DEST=X8700 in order to have their output printed on the Laser Printer. When the 8700 goes into production on September 10, it will become the default destination CENTRAL. Note that when this happens, output destined for the "CENTRAL" printer, with the old numeric forms codes, will not be printed; jobs destined for the line printer must be coded with DEST=IBM1403. The only new information required to print on the 8700 is the series of forms codes for this printer. All 8700 forms codes consist of four letters of the general form: IJKL.

I - specifies the type of paper to be used. The 8700 prints on 8.5 x 11 inch paper only. You may request three-holed paper and double-sided printing. No-hole paper can be shifted .25 inches from the left margin for binding. Three-holed paper is automatically shifted.

J - specifies the layout. Portrait layout (printing is parallel to the short edge of the paper) is available in 1-up and 2-up. One-up prints one page image per side of paper; two-up prints two page images per side of the paper. Landscape (printing is parallel to the long edge of the paper) is available in 1-up only.

K - specifies the character set or format to be used. Most of the character sets found on the line printer are available on the 8700. The 9700 formats, previously offered in the 9700 Printing Service, are also available. (See next article.)

L - specifies the width of the margin. The margin can range from 0 to 1.5 inches.

The default setup for the 8700 consists of the TN modified character set, 1-part 8.5 x 11 inch blank paper without holes, 2-up double-sided portrait printing and .50 inch margin, FORMS=YCAC. Other printer setups are requested by using forms codes selected from the chart below.

Important Note:

1. Please note that there will be no forms mount charge for any forms beginning with "N", "Y", or "B". A forms mount charge is levied against other forms.
2. Two-up portrait printing is not available for the APL character set; therefore, forms code "xCDx" (where x is any value for that column) is invalid and should not be used.

Users familiar with the line printer forms codes can choose equivalent 8700 forms codes from Chart 1 below.

8700 FORMS CODES Chart 1			
PAPER I	LAYOUT J	CHARACTER SET K	LEFT MARGIN L
N - No Holes Simplex	A - Landscape 1 Up	A - TN modified	A - 0.00
Y - No Holes Duplex	B - Portrait 1 Up	B - ALA standard	B - 0.25
B - No Holes Shifted	C - Portrait 2 Up	C - ALA modified	C - 0.50
O - 3 Holes Simplex	X - when n/a	D - APL standard	D - 0.75
D - 3 Holes Duplex			E - 1.00
Z - Special			F - 1.25
			G - 1.50
			X - when n/a

Note - All margins are given in inches unless otherwise indicated.

User-Supplied Setups

8700 forms codes beginning with Z are reserved for setups requiring user-supplied paper or other nonstandard requirements. The allocation of these codes is arranged through the operator at the Machine Room, MP367. If you request paper not supplied by UTCS, you must ensure that a sufficient quantity is kept in stock. This can be arranged with the operator. At the time of writing, the procedure to set up User-Supplied 8700 Forms had not been finalized. Please contact Pat Hood (978-4548) for further information if you are interested. Also, please see the UTCS Guide to Highspeed Printing for further details.

Submitting Output for Printing

The APL workspace "1 HSPRINT" contains the utility used to request highspeed printing. For more information on the use of this utility, type:

```
)LOAD 1 HSPRINT
DESCRIBE
```

The primary sources of documentation for the 1 HSPRINT utility are the SHARP APL Technical Notes 2 and 8 (SATN-2, SATN-8) which are available at the UTCS Information Office, or directly from I.P. SHARP Associates. There are a large number of documentation variables in the workspace. Most of them are taken out of SATN-8 and are quite long. There are also a few "HELP" variables in the workspace which have been added by UTCS.

For more information important to APL users printing on the 8700, please look in workspace 1 HOTNEWS. Problems or questions may be directed to Advising Services, 978-HELP.

DECsystem-10

The IPRINT utility command is used to submit a job for printing. (It is assumed that the defaults have not been changed in your SWITCH.INI file.) If you wanted to print the file "DOC.LPT" on the 8700, the command would be:

```
IPRINT=DOC.LPT
```

This would print your file using the default DEST=CENTRAL and FORMS=YCAC. Other forms can be specified by including the "FORMS" switch in the IPRINT command.

For example:

```
IPRINT=DOC.LPT/FORMS:BBLE
```

GPJS

Printing on the 8700 can be specified in the JCL in three ways:

1. With the /*JOBPARM and /*ROUTE PRINT statements.
2. With the /*OUTPUT statement.
3. With a combination of ROUTE parameters and SYSOUT options on the DD statement.

8700 continued

The first two methods are recommended. See the "UTCS Guide to GPJS" for more detailed information.

To print on the 8700 using the first method, you would code:

```
/*ROUTE PRINT CENTRAL
```

TSO

In TSO, you can submit a Batch job that will print your output dataset and route it to the forms and destination that you request. Alternatively, you may use the DUPLICAT command. If you wanted to print the dataset "MYDATA.LIST" on the 8700 (CENTRAL) printer using default standard forms, the command would be:

```
dup mydata.list
```

This would print your dataset using the default destination "CENTRAL" and forms(YCAC).

WYLBUR

In WYLBUR, the LIST OFFLINE facility is used to route your document to a printer. First, you must bring the member into your ACTIVE file. Then, to print the dataset member "document" on the 8700 (CENTRAL) printer using standard forms, the command would be:

```
list offline unnumbered
```

This would print the member in the ACTIVE file using the default destination CENTRAL (assuming that "set dest" was not used to reroute it) and standard forms YCAC. If the document included control characters, you would include the keyword "cc" in the command.

UNIX

The procedure for submitting jobs to the 8700 from UNIX has not been finalized. Users will be notified of the changes via HOTNEWS. Information can be found on-line in *man 1 ipr*.

This would print your output on the 8700 (destination CENTRAL) with the standard forms YCAC. Nonstandard forms could be requested by including the /*JOBPARM statement, as in the following example.

```
/*JOBPARM FORMS=NAAC
/*ROUTE PRINT CENTRAL
```

Output

When your job is printed, it is removed from the printer, separated from the jobs which precede and follow it, and filed.

Printed output is filed alphabetically by the first two characters of the username. The filing bins are located in the hallway outside the Machine Room and are divided into clearly marked alphabetical ranges. You are expected to retrieve your own output from these bins.

A single page of output filed in place of the entire printout indicates that the printed output was too large for regular filing. This sheet should be given to the operator who will retrieve the output for you. Output is kept for approximately one week before it is discarded.

Confidential output is filed by UTCS staff inside the Machine Room. To retrieve it, you must request it by name from an operator. Confidential output is identified by coding two slashes (//) at the beginning of the user name or jobname which appears on the header and trailer pages of your output. Check the list of options associated with the print command or utility you are using for the correct method of indicating confidential output.

For detailed information about 8700 printing, please see the UTCS Guide to Highspeed Printing available at the UTCS Information Office (Engineering Annex, Room 206).

Patricia Hood

The 8700 Laser Printer: Changes for 9700 Users

When the 8700 Laser Printer goes into production, the 9700 Printing Service will be discontinued (the projected date is the end of September). This will benefit users in two major ways: printing costs will be much lower, and turnaround time will be reduced from days to hours. There is also a wider range of fonts and profiles on the 8700 (see preceding article).

However, those accustomed to the 9700 will have to make some changes. DJDE statements have been replaced by single forms codes which specify the type of printing. The 9700 formats, e.g., 10PALA, 12PTY, FMT1C, will be available on the 8700; users will request them by specifying a forms code of the general format IJKL in the print command used to print their output.

I - specifies the type of paper to be used. (See preceding article.)

J - specifies the layout. *For all 9700 formats, X must be coded for the layout.*

K - specifies the character set or format to be used. The 9700 formats from the 9700 printing service are available by specifying letters F through R.

L - specifies the width of the margin. The margin can range from 0 to 1.5 inches.

Users familiar with the 9700 Printing Service can choose equivalent forms codes from Chart 2, below. For example, format 10PALA would be specified on the 8700 by choosing FORMS=NXFA; FMT1C would be specified with FORMS=NXQA. The choice of paper and left margin are up to the user.

If no forms code is requested in the print statement, then the default setup will be used. The setup for the 8700 consists of the TN modified character set, 1-part 8.5 x 11 inch blank paper without holes, 2-up double-sided portrait printing and .50 inch margin, FORMS=YCAC.

For line printer equivalents, see the preceding article. For detailed information on all aspects of highspeed printing, see the UTCS Guide to Highspeed Printing, available at the UTCS Information Office.

The 8700 laser printer does not duplicate the 9700 Printing Service exactly. Users interested in bold or italic printing will now use the 8700 Document Printing Service. Contact Pat Hood at 978-4548 or see the UTCS Guide to HighSpeed Printing for details.

8700 FORMS CODES Chart 2				
PAPER I	LAYOUT J	CHARACTER SET K	LEFT MARGIN L	
N - No Holes Simplex	X - when n/a	F - 10PALA*	A - 0.00	
Y - No Holes Duplex		G - 10LALA*	B - 0.25	
B - No Holes Shifted		H - 13PALA	C - 0.50	
O - 3 Holes Simplex		I - 13LALA	D - 0.75	
D - 3 Holes Duplex		J - 10PPL*	E - 1.00	
Z - Special		K - 10PPLL*	F - 1.25	
		L - 10PTY*	G - 1.50	
		M - 10PTYL*	X - when n/a	
		N - 12PPL		
		O - 12PTY		
		P - 12PTYL		
		Q - FMT1C*		
		R - FMT6C*		
<i>Note - all margins are given in inches unless otherwise indicated.</i>				
<i>* Italic and bold printing available through 8700 Document Printing Service.</i>				

The 8700 Laser Printer: Accounting

The 8700 accounting process fits into the SAC charging that will charge for all aspects of 8700 and 1403 printing. (See "New Charging Methods for Printed Output" later in this issue, for more information about the new SAC charging.) For printing done on the 8700, there will be no per-job charge. Since printing can be done 1-up (one page image per side of the paper) and 2-up (two page images per side of paper), the cost of 8700 printing decreases as the number of page images per sheet of paper increases.

- Page image charges (in cents) for one- and two- sided printing are the following:

Forms printing	will charge (per page image):
1-up, 1 sided	.05
2-up, 1 sided	.025
1-up, 2 sided	.045
2-up, 2 sided	.023

The default printing will be 2-up, two-sided (FORMS=YCAB). Users must request other 8700 forms codes to obtain 1-up or one-sided printing. (See "The 8700 Laser Printer: How To Use It" in this issue.) There will be a \$2.00 setup charge per job for forms "O", "D", and "Z".

User-supplied setups will be available, but the procedure and charges have not been finalized. Please contact Pat Hood at 978-4548 for information, if you are interested.

Patricia Hood

The 8700 Laser Printer: User Seminar

On August 14 at 10:00 a.m. and August 16 at 2:00 p.m. UTCS will present seminars on the use of the XEROX 8700 Laser Printer. These seminars will be held in McLennan Physical Laboratories, Room 102, and anyone interested in using the 8700 Laser Printer is invited to attend.

Presentations on the capabilities and use of the 8700 Laser Printer will be given during the seminar. Sample output featuring the various fonts and profiles will be available.

There will also be a short question period during which UTCS staff will answer questions about this new printing service. For more information, contact Pat Hood at 978-4548.

Plan to attend the 8700 User Seminar. Come and see what 8700 Laser Printing can do for you.

Patricia Hood

The 8700 Laser Printer: User Test

The 8700 Laser Printer User Test will take place from August 27 through September 9, 1984. During this time, users are encouraged to print their output using "DEST=X8700" in order to see what the 8700 Laser Printer can do. (See "The 8700 Laser Printer: A Look at the Machine",

earlier in this issue.) UTCS encourages active user involvement during this test period. When the 8700 is in full production it will become the "CENTRAL" printer, and, there will be only one IBM1403 line printer available for highspeed printing of special forms which cannot be moved to the

continued...

User Test 8700 continued

8700. All users interested in trying out the 8700 Laser Printer, or who would like to know more about the printer, may contact Pat Hood at 978-4548 for more information. Detailed instructions for the use of the 8700 are found in the "UTCS Guide to

HighSpeed Printing," available at the UTCS Information Office. Also, see "The 8700 Laser Printer: How to Use It" earlier in this issue.

Patricia Hood

New Charging Methods for Printed Output

Effective July 3, 1984, UTCS moved from charging by line to charging by page for all printed output from the IBM 3033/N12. To determine the number of pages to be charged, the system calculates the number of lines printed divided by 60 and compares this number to the number of page skips requested; the **greater** of these two numbers is the page count.

The charge will be 10 cents per page for all UTCS-supplied standard paper, excepting jobs routed to Policy Analysis (//PAT), where the charge is 12 cents per page.

There will be an adjusted rate for special forms and user-supplied forms.

All output charges are now reflected in the GPJS Service Access Code (SAC) balance on the CAN report.

Following is a revised internal rate schedule for forms output. External users should contact the UTCS Accounting Services Office for external rates.

INTERNAL RATE SCHEDULE FOR FORMS OUTPUT		
FORMS CODE	DESCRIPTION	PRICE/PAGE
<i>(1000 - 8000 Series)</i>		
XX00	11 X 15 1-Part Lined	\$.110
XX01	11 X 14 1-Part Blank	\$.110
XX02	11 X 15 2-Part	\$.126
XX03	11 X 15 3-Part	\$.139
XX04	11 X 15 4-Part	\$.156
XX05	1 7/16 X 4 1-Up Labels	\$.018
XX06	15/16 X 3 1/2 3-Up Labels	\$.019
XX07	1 7/16 X 4 3-Up Labels	\$.029
XX08,09	11 X 8 1/2 1-Part Lined	\$.107
XX10,11	11 X 8 1/2 2-Part	\$.117
XX12	11 X 8 1/2 3-Part	\$.124
XX14	11 X 8 1/2 4-Part	\$.136
XX16-18, XX20-23	11 X 9 1/2 1-Part Blank	\$.111
XX30,31	8 1/2 X 15 1-Part Lined (Standard)	\$.100
XX32	8 1/2 X 15 2-Part	\$.121
XX33	8 1/2 X 15 3-Part	\$.132
XX34	8 1/2 X 15 4-Part	\$.145
XX35	8 1/2 X 15 1-Part Blank	\$.108
<i>(9000 Series)</i>	USER-SUPPLIED FORMS	\$.040

Marg Doherty

Summer Class E Rate

In past years, UTCS offered a reduced summer rate for Class C jobs. With the demise of Class C, UTCS is now offering a reduced Class E rate for the duration of the summer. For the period July 6 through September 16, the Class E CPU rate factor will be 0.04, rather than 0.06.

During this same period, Class E jobs will be executed between the hours of 20:00 and 06:00 on weekdays and between the

hours of 10:00 and 18:00 on Saturdays and Sundays. Moreover, some Class E jobs not requiring operator intervention (e.g., tape mounts) will be released for execution before unattended periods.

At the end of the summer period, the Class E rate will revert to a permanently reduced rate of 0.05 and not 0.06.

Bob Chambers

UTCS Microcomputer Support Group

Microcomputer usage at U of T has been growing by leaps and bounds for the past few years. With the Micro Discount Plan, begun in June, there has been a steady stream of users climbing on to the micro bandwagon.

Because of the increased usage, UTCS has established the Microcomputer Support Group (MSG), consisting of Paul Roth (Supervisor), Willard McCarty, and Gregory Stopelli. (Grant Davis, UTCS' Micro Specialist for the past two years, has left the University; his former clients are encouraged to call upon the MSG).

In addition to personnel changes, the Micro Lab itself has undergone some changes, moving from McLennan Labs Room 221 to the larger Room 220A, with MSG staff located in Room 257 (the former Central Advising Office). The Lab is available, by appointment, to academic staff and researchers and may be used for micro-related courses and seminars.

The Micro Support Group's main responsibilities and duties are:

- Provide **consulting/advising** in the microcomputer field. This is normally done by individual appointment. Many people consult us about selecting appropriate

hardware and software; clients include academic staff and researchers requiring advice on Micro Discount Plan purchases.

- Provide written **documentation** for micro hardware and software. This will include, in upcoming months, an "Academic's Guide to Purchasing a Microcomputer," evaluations of various micros (initially the ones in the Discount Plan), descriptions of **software available** at UTCS, and an "IBM Compatibility Guide." The eventual aim is to coordinate all our micro documentation into a UTCS Catalogue of Micro Products and Services.
- Conduct seminars on the use of micros. By early August we will be offering seminars on "Micro-to-Mainframe Transfer", and "Care and Feeding of your Microcomputer", and we expect to run the first of a series of Open Houses in the Lab in mid-August. Also planned are "Introduction to Word Processing for Microcomputer Users" and "Introduction to Data Base for Microcomputer Users."

Other Microcomputer News

On the software front, UTCS is now supporting PC-PLOT®. This terminal emulation package, available from Microplot Systems, allows TSO users to do interactive

continued...

MSG Group continued

graphics from an IBM PC or PC-compatible micro. (See the next article.)

UTCS now has a notice board at the Textbook Store and Computer Shop, devoted to announcements of UTCS micro seminars, events, and general information. It is located near the micro demonstration area.

We would like to invite all new micro

users, as well as all established users, to take advantage of MSG's services: please phone us at 978-5071.

Paul Roth

® PC-PLOT, Microplot Systems,
Columbus, Ohio.

IBM Personal Computer Graphics on TSO

We are happy to announce the support of TSO graphics on IBM Personal Computers running the PC-PLOT® software package. This is effective on approximately August 7, 1984; the exact date will be published in HOTNEWS.

PC-PLOT from Microplot Systems, permits an IBM (and its compatibles, such as Eagle and Olivetti/Corona) to emulate simultaneously a VT100 for communication purposes and a Tektronix 4010 for graphics. It also accepts colour commands in the form of Tektronix 4027 formats.

The emulation of a VT100 by PC-PLOT allows IBM users to log on to the IBM 3033/N12 TSO in Line Mode (Class 32) or in Fullscreen Mode via Series/1 (Class 132).

To allow IBM PC users to enjoy PC-

PLOT's graphics capabilities, UTCS has developed appropriate PC-PLOT drivers in KIG on our mainframe. The PC-PLOT drivers will be available on production status with full support for SAS/GRAPH and users' graphics programs calling PLOT-BASIC FORTRAN routines. In TSO, on-line information, including names of drivers and libraries, may be obtained by entering HELP PCPLOT.

For further information or a demonstration, please contact Kin Fong at 978-4924. The SNAC and MSG Groups will also be pleased to assist users with questions relating more to their respective areas.

Kin Fong

® PC-PLOT, Microplot Systems,
Columbus, Ohio.

Humanities News - Status of COGS

Humanists at the University of Toronto are fortunate in having several concordance generating programs. The one most often used at UTCS is COGS (CONcordance Generating Program). COGS is a favorite because of its reliability, flexibility, and low cost (in comparison to such programs as the Oxford Concordance Program). It was written some years ago by UTCS' John Bradley to replace an older program called

COCOA. Now it is maintained by Lidio Presutti, who is responsible for Humanities Computer Applications Support at UTCS.

Since its introduction, many users have requested new features for COGS, and a number of changes and improvements have been made. However, the only documentation available for COGS has been the *COGS User's Guide*, which describes the

continued...

Humanities News continued

1981 version. This was particularly unfortunate for a program of considerable importance to many humanists in Toronto. Through the efforts of the Department of English and Professor Ian Lancashire, chairman of the Natural Language Processing Steering Committee, this difficulty has now been remedied. Vera Petrashkewych, a U of T student specializing in Computer Science and in French Language, Literature and Translation, has contracted to update the *COGS User's Guide* to include the many new features added by John Bradley and Lidio Presutti.

The rest of this article will describe some of the new commands and features in COGS.

The translate command allows the proper printing of encoded letters of the alphabet in transliterated text. This is dependent on the limits of the line printer. For example, you might be working with an Old English text containing the "thorn" character/letter encoded as "p backspace b". With the translate command, you would be able to instruct COGS to print the symbol combination of "p backspace b" as the true thorn character on the line printer. A number of accents are predefined with names understood by the translate command, i.e., if within your text you encode the diacritic "e grave" as "\e" you can instruct COGS to

map the symbol combinations "\e" as "e grave" for the line printer.

COGS now gives you more control over the appearance and content of the context line. The number of characters of context, the length of the citation reference field, and the position of the headword in the context line may be changed. Also, the COGS user now has more control over what text is included in the context line: you can ask COGS to include text that it is not concord-ing, and you may selectively exclude from the context line bracketed text, such as "text references".

Most recently, a new program, COGSE, has been added to the COGS system. This program provides some basic tools that allow the scholar to produce a "lemmatized" concordance.

In the future, COGS should provide a good base to meet new requirements of humanists at Toronto. With the XEROX 8700 Laser Printer, more character sets may be available to humanists for the production of better looking concordances. COGS is maintained and supported by UTCS on the recommendation of the Natural Language Processing Steering Committee.

Lidio Presutti

SPSS-X Release 2.0

The first general release of SPSS-X Release 2.0 was available for testing on June 11 and became the production version on July 9. The previous release of SPSS-X at UTCS was Release 2.0A, a test release which was installed to allow use of LISREL.

There are several errors which have been fixed with SPSS-X 2.0. The most severe error, the inability of SPSS-X to use secondary extents, has been corrected. Other small problems with CROSSTABS, FREQUENCIES, and REPORT have also been cleaned up.

Release 2.0 adds five entirely new procedures plus extensive facilities for adding users' procedures to the system. It also contains enhancements to its data definition commands, expanding the kinds of files the system can read directly and providing more flexibility. As well, there is now more control over the appearance of printed output.

The new CLUSTER procedure hierarchically clusters cases with a variety of clustering methods and a choice of distance measures.

continued...

SPSS-X Release 2.0 continued

HILOGLINEAR calculates parameters and measures of fit for hierarchical models with categorical variables. The PLOT procedure is a general purpose line printer plot routine that can produce regression plots, contour plots, overlay plots, and scatterplots with or without control variables. PROBIT (which was released in 2.0A) estimates the effects of one or more independent variables on a dichotomous dependent variable. The QUICK CLUSTER procedure efficiently clusters a large number of cases into a specified number of groups.

Although the IMPORT and EXPORT commands are documented in the *SPSS-X User's Guide*, they were not available in the previous releases. The EXPORT command is used to create a portable file. An SPSS-X portable file is one which can be read on a machine other than that on which it was created. The IMPORT command is used to read SPSS-X portable files created with the EXPORT command. For example, at UTCS you can use the IMPORT command to read a portable file created with the EXPORT command at a DIGITAL VAX site. For more information, see Chapter 16 on File Interfaces.

The new facilities which have been added in Release 2.0 include:

1. The ADD VALUE LABELS command, which allows you to add new value labels without altering others.
2. The END subcommand on DATA LIST, which gives you control over end-of-file processing. (Tested in Release 2.0A)
3. Additional keywords on the SHOW command.
4. The XSAVE command, a transformation command used to save a system file.

Documentation for the new facilities and procedures can be obtained through the INFO command. Possible procedure specifications include PLOT, CLUSTER, LISREL, PROBIT, HILOG and QCLUSTER. Users are cautioned against using INFO ALL - this job will print over 8,000 lines. Instead, just the sections of special interest should be selected, for example, INFO LOCAL PLOT / LISREL. The INFO command can be found on page 24 of the *SPSS-X User's Guide*.

There are two other manuals currently available: *SPSS-X Introductory Statistics Guide* and *SPSS Basics*. An Advanced Statistics Guide has been advertised; however, it has not yet been published and is not expected to be out until the fall. The exercises in the above manuals mention some SPSS-X system files to be used. They are available and are called:

APPL.STAT.SPSSX.PRODUCTS.SYSFILE
(the products data file),
APPL.STAT.SPSSX.ELECTRIC.SYSFILE
(the Western Electric study),
APPL.STAT.SPSSX.BANK.SYSFILE
(the bank employee data file),
APPL.STAT.SPSSX.GSS82.SYSFILE
(the General Social Survey file),
APPL.STAT.SPSSX.GUITAR.SYSFILE
(the guitar survey data), and
APPL.STAT.SPSSX.ALMANAC.SYSFILE
(the almanac data on 25 cities).

If you are having any problems with SPSS-X, please call Advising Services at 978-HELP for assistance.

Diane Mitchell

Drawing Box Plots with SAS/GRAPH®

When you are starting to analyze some data, sometimes a graphical display can help you much more than pages of numbers. Most people are familiar with histograms and scatterplots, but there are many other powerful graphical techniques which can also be very useful.

One simple method of summarization is called the box plot. It was made popular by the book *Exploratory Data Analysis*, by John Tukey (1977), and has been enhanced by several others since. In the box plot, the upper and lower quartiles of the data are indicated by the top and bottom edges of a rectangle, and the median is represented by a horizontal line segment within the rectangle. Lines, or “whiskers,” extend from the ends of the box to the “adjacent values,” which are either the extreme values or the defined range of the adjacent values. If a value lies outside of the range of the adjacent values, it is called an outside value and is plotted as an individual point.

The box plot gives a quick impression of the distribution of the data. The median shows the centre of the distribution. The central 50% is seen as the length of the box. The lengths of the lines relative to the box show how long the tails of the distribution are. As well, the individual points give you the opportunity to consider the possibility of outliers.

Box plots are available with the PLOT option in PROC UNIVARIATE or with PROC SPLOT, but there is no direct method for producing box plots with SAS/GRAPH. With a little bit of work however, you can get some nice results. In the following example, we are looking at average monthly temperatures over several years.

```
DATA TEMPTURS;
  INPUT TEMP MONTH;
  CARDS;
  :
```

```

:
PROC SORT; BY MONTH;
PROC UNIVARIATE NOPRINT;
  BY MONTH;
  VAR TEMP;
  OUTPUT OUT=STATS Q1=Q1 Q3=Q3 MEDIAN=MEDIAN
    MIN=MIN MAX=MAX;
DATA ALLCALC;
  SET STATS;
  TOP=Q3+1.5*(Q3-Q1);
  IF MAX<TOP THEN TOP=MAX;
  BOTTOM=Q1-1.5*(Q3-Q1);
  IF MIN>BOT THEN BOT=MIN;
DATA BOX;
  SET ALLCALC;
  PART=1; TEMP=Q3; OUTPUT; TEMP=Q1; OUTPUT;
  TEMP=MEDIAN; OUTPUT;
  PART=2; TEMP=TOP; OUTPUT; TEMP=BOT; OUTPUT;
  TEMP=MEDIAN; OUTPUT;
  KEEP MONTH TEMP PART;
DATA OUTSIDE;
  MERGE TEMPTURS ALLCALC;
  BY MONTH;
  IF TEMP>TOP OR TEMP<BOT THEN DO;
    PART=3; OUTPUT;
  END;
  KEEP MONTH TEMP PART;
DATA WHISKER;
  SET BOX OUTSIDE;
PROC GPLOT;
  PLOT TEMP*MONTH=PART / NOLEGEND;
  SYMBOL1 I=HILOBC C=RED;
  SYMBOL2 I=HILOTC C=RED;
  SYMBOL3 I=NONE V=STAR C=RED;
  TITLE1 BOX PLOTS;
  TITLE2 FOR EACH MONTH;
```

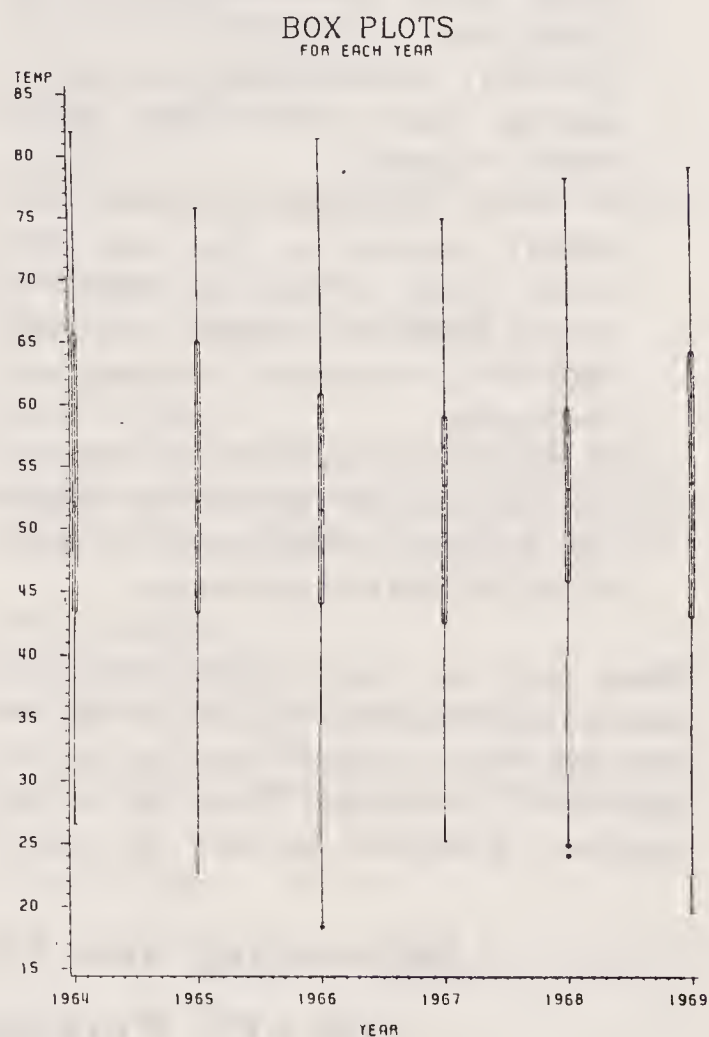
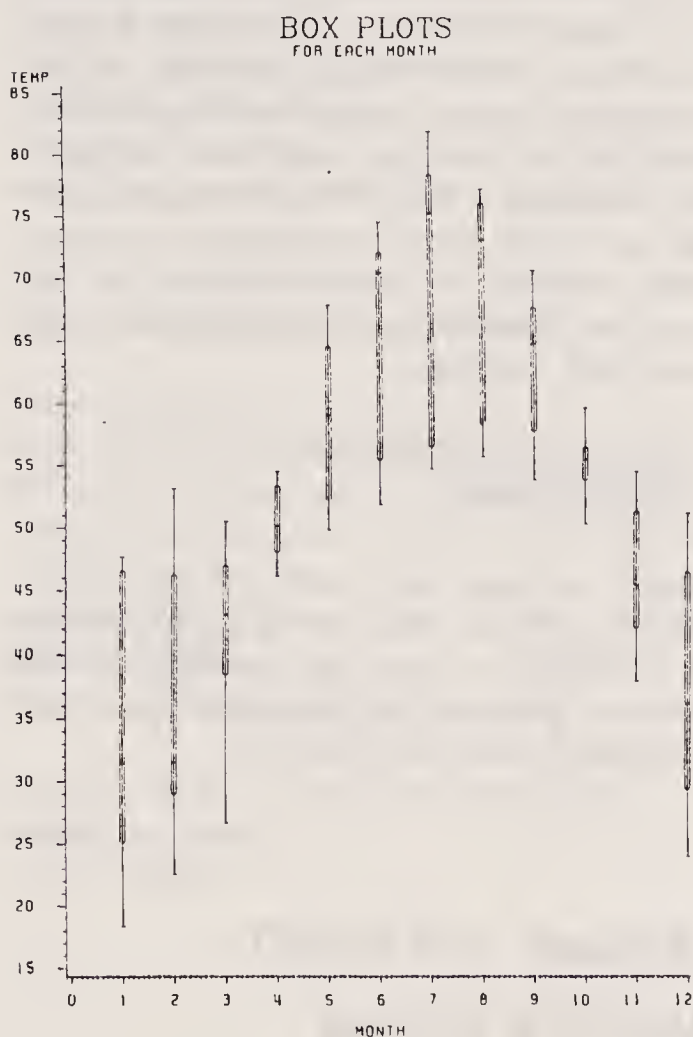
The initial DATA step reads in our data, then PROC SORT orders the data by month so that we can produce a box plot for each month. PROC UNIVARIATE calculates the five statistics we need and puts them into another data set for further use. The data step ALLCALC calculates the adjacent values, and the data set BOX contains the necessary points to plot the box and whiskers. The data step OUTSIDE checks to see if there are any outside points which should be plotted as a single point.

continued...

SAS/GRAPH® continued

The data set WHISKER combines BOX and OUTSIDE to prepare them for plotting with PROC GPLOT. The HILO interpolation (documented in SAS Technical Report P-121) neatly produces the boxes and whiskers we want, and the outside values are plotted as stars.

An excellent reference for anyone who is interested in learning more about box plots and other graphical displays is *Graphical Methods for Data Analysis*, by J.M. Chambers et al, Wadsworth, Inc., 1983.



Diane Mitchell

Converting to HSPRINT

In the March issue of *COMPUTERNEWS*, it was announced that the APL High Speed Print utility had been installed for production at UTCS. Since then the public library workspace 1 NEWRELEASE, which previously used FILEPRINT, has been converted to HSPRINT. The workspace lister, 4 DOCWS, has been completely replaced by the workspace 4 WSLIST. Among WSLIST's many advantages is the fact that it uses HSPRINT.

In the same article, it was mentioned that 1 HSPRINT will eventually replace 1 FILEPRINT entirely. It is our intention to complete this conversion by January 1985. Between now and then, we will be progressively decreasing service on FILEPRINT in favour of HSPRINT. With this in mind, we strongly urge users of FILEPRINT to ob-

continued...

HSPRINT continued

tain documentation about the HSPRINT facility and to begin work on converting their applications. This should be done as soon as possible. There are several advantages to making this conversion immediately:

1. HSPRINT is a superior product which allows more control over print requests than FILEPRINT.
2. HSPRINT requests will soon be receiving faster service than FILEPRINT requests.
3. It will not be possible to submit FILEPRINT requests to the new 8700 Laser Printer. It will be possible to submit HSPRINT requests, since with HSPRINT it is possible to choose your destination.
4. If the conversion is left till the last minute, you will run the risk of having a system which does not work when FILEPRINT goes away.

Please note that there will be some work required for conversion whether or not you used the format control functions in the FILEPRINT workspace. There are a few significant differences between the use of

these functions and those provided by 1 HSPRINT.

The primary sources of documentation for the 1 HSPRINT utility are the Sharp APL Technical Notes, numbers 2 and 8 (SATN-2, SATN-8). These are available at the UTCS Information Office, or directly from I. P. Sharp Associates. There are a large number of documentation variables in this workspace, most of which are taken directly from SATN-8 and are quite long. In addition there are a few "HELP" variables added by UTCS which summarize the functions available in this workspace. To explore the in-workspace documentation, sign on to APL and type:

```
)LOAD 1 HSPRINT
DESCRIBE
```

Again, we urge any users of the FILEPRINT utility to begin work on converting to HSPRINT as soon as possible. If you have any problems or questions, please call Advising Services at 978-HELP.

Mary Ann Lawry

Announcing New APL Workspace: 4 WSLIST

Old APL Workspace: 4 DOCWS Deleted

On Thursday May 24, 1984, the workspace listing utility, 4 WSLIST, was installed in the UTCS SHARP APL public library. This utility was originally written by Mark Sutton, a graduate student in Physics. It has since been reworked and packaged for production by UTCS applications. WSLIST completely replaces an older utility, 4 DOCWS, which was deleted July 4.

WSLIST is in many ways superior to DOCWS. It allows much more control over the form of the output and includes cross-referencing information. Most importantly, it uses the new HSPRINT utility, which is replacing the older FILEPRINT utility.

WSLIST also contains a function, LISTDOC, which will print the values of all variables in a workspace which belong to a group called "DOCUMENTATION". Most of the workspaces in the public libraries 1 through 10 have all of their documentation variables gathered into such a group, so LISTDOC is a convenient way of printing the documentation about these workspaces.

To find out about WSLIST, load the workspace 4 WSLIST and examine the documentation variable, DESCRIBE.

```
)LOAD 4 WSLIST
DESCRIBE
```

continued...

APL Workspace continued

In the following example, a user lists an APL workspace called 12345 UTILITY and allows WSLIST to choose defaults for the format of the listing. (The user's responses are underlined.)

```

)LOAD 12345 UTILITY
SAVED 15.24.54 04/13/84
)COPY 4 WSLIST LISTWS
SAVED 10.59.19 05/24/84
LISTWS
'WORKSPACE LISTING IN PROGRESS - PLEASE STAND BY'

WSLIST--30/MAY/84 (12:39 PM)
LISING OF APL WORKSPACE: 12345 UTILITY

COMMAND? PRINT
ENTER NAME OF PRINTFILE TO BE CREATED: LISTING
APPENDING INFORMATION TO FILE, PLEASE STANDBY
APPENDED INFORMATION TO FILE: 12345 LISTING TIED TO: 5

COMAND? HSPREQ
PRINTSPECS: 7001
DELIVERY INSTRUCTIONS: SMITH, JOANNE

REQ.NO 300 FILED 12345 12.42.12 30 MAY 1984

COMMAND? END

```

In the next example, the user lists all of the documentation variables in the public library workspace, 1 HSPRINT. She is requesting that two copies be printed on UTCS forms 7009.

```

)LOAD 1 HSPRINT
SAVED 13.55.04 02/15/84
)COPY 4 WSLIST LISTDOC
SAVED 10.59.19 05/24/84
LISTDOC
'WORKSPACE LISTING IN PROGRESS - PLEASE STAND BY'

WSLIST--30/MAY/84 (12:39 PM)
LISING OF APL WORKSPACE: 12345 UTILITY

COMMAND? PRINT
ENTER NAME OF PRINTFILE TO BE CREATED: LIST
APPENDING INFORMATION TO FILE, PLEASE STANDBY
APPENDED INFORMATION TO FILE: 12345 LIST TIED TO: 5

COMAND? HSPREQ
PRINTSPECS: D02,7009
DELIVERY INSTRUCTIONS: SMITH, JOANNE

REQ.NO 300 FILED 12345 12.42.12 30 MAY 1984

COMMAND? END

```

Mary Ann Lawry

The May 1983 Release of Sharp APL

Towards the end of the summer of 1984 we expect to be installing the May 1983 Release of Sharp APL. This Release brings a number of improvements and extensions to the APL language and system. Some of the more interesting changes are briefly mentioned here. For more complete information, please examine the Newrelease document accessible through the public library workspace, 1 NEWRELEASE.

1. Sharp APL will automatically increase the size of the workspace symbol table, instead of reporting "SYMBOL TABLE FULL".
2. There have been a few minor changes affecting the APL del editor.
3. HSPRINT will be able to print enclosed arrays, and a new function will be added to 1 HSPRINT to allow you to set ☐PS in the printfile.
4. There will be a new file access permission code. This will allow you to grant explicit ☐SIZE access to a file.
5. An attempt to execute a primitive dyadic function monadically will be reported as a "DOMAIN ERROR". This is currently reported as a "SYNTAX ERROR".
6. There are four new functions: conditional enclose, link, lev, and dex.

continued...

The May 1983 Release of Sharp APL continued

7. The Domino functions have been extended to accept arguments higher than two in rank.
8. The On, Over, and With operators have been extended.
9. The system function 2 □WS 3 has been extended. The fifth element of the result of this function will indicate whether or not the active workspace was saved by crash recovery.
10. The public library workspace 1 WSFNS has been completely re-written. The functions in the workspace now use the Quad functions wherever possible.

Mary Ann Lawry

ISPF and PDF at UTCS

The latest releases of the IBM software products ISPF and PDF are now available through TSO. The Interactive System Productivity Facility (ISPF) is a “dialogue manager” for interactive applications. Various interactive applications run under ISPF. Two of the more commonly used ones supplied by IBM are PDF (see discussion, below), the most frequently used editor under TSO, and SDSF, which allows users to check and retrieve their jobs from Batch queues.

As a dialogue manager, ISPF is designed to simplify communication from an application program to the user. ISPF does this in a standard way using complete screen images called “panels.” Through ISPF, not only can the cost of application software be lowered; the cost of training is also lowered because applications appear to have the same user interface.

ISPF provides services to interactive applications running under its control. Developers of these applications rely on ISPF to:

- Display a hierarchy of predefined screen images (panels) and messages based on user selections.
- Communicate with the user through data entry displays and messages.
- Provide access to predefined assistance screen images for each application, either sequentially (tutorial mode) or by direct access to the requested page (help mode).

- Create and maintain tables of user information.
- Generate output files for job submission or other processing using model “skeletons”.
- Provide split-screen displays through which the user may partition the display screen into two “logical” areas.
- Interface to edit and browse facilities of PDF.
- Intercept user-entered commands and take appropriate action based on information contained in special command tables.

Although ISPF applications can be written in languages such as FORTRAN, PL/I, and TSO/CLIST, their design is quite complex. Most users will not want to have their own ISPF application. Rather it is expected that most users will learn the ISPF user interface and then benefit from the consistent use of this interface by a variety of applications.

IBM has announced that ISPF is a strategic product and that future interactive products will utilize it. Currently ISPF runs on all three of IBM’s major interactive services (MVS/TSO, VM/CMS, and VSE/ICCF). At UTCS, ISPF is available under MVS/TSO.

What is ISPF/PDF?

The Interactive System Productivity Facility/Program Development Facility (ISPF/PDF or just PDF) program from

continued...

ISPF and PDF continued

IBM is an interactive application which is available under MVS/TSO at UTCS. PDF allows a user to perform a number of different tasks easily. Among its more frequently used features are:

- Fullscreen editing of user data or programs. The most frequently used editing functions are invoked by simple, one character commands. PDF lowers system overhead by allowing multiple changes and additions to information on a screen without mainframe processing for each one.
- Scrolling (in any direction) of user source data and listings. Also, location of data by character string or line number.
- Interfaces to FORTRAN, PL/I and the linkage editor, allowing them to be invoked for Batch jobs or for foreground processing.
- Utilities to create and maintain libraries and data sets.
- Multilevel programming library support

allows maintenance and tracking of program segments which use different "versions" or "levels."

- Online assistance for instruction and reference may be accessed in either tutorial or help mode. This feature is especially valuable for the new or occasional user.

ISPF/PDF is a successor product to the System Productivity Facility (SPF), which in turn was successor product to the Structured Programming Facility (also SPF). Those accustomed to using the SPF command should type TSO's STARTPDF command instead. The "C" option in the primary menu will display a summary of changes for this release.

For more information, please phone Advising Services at 978-HELP.

Alex Nishri

UTCS Changes ISPF/PDF Recovery Option

With the installation of ISPF/PDF, UTCS modified the PDF Edit panel so that recovery is always on.

When recovery is on, an audit trail of user interactions is recorded in a special PDF maintained dataset. After a system failure, the audit trail can be used to replay the edit session.

UTCS set the recovery default to "on" in order to make the system appear friendlier in case of a terminal or system failure. However, there are some negative effects. First, with recovery on, there are extra I/O operations which maintain the recovery data set. This will increase both the response time and the cost of using PDF.

Second, with recovery on, the first change to the data causes a complete copy of the data to be written into the recovery dataset. This will increase response time even more for the *first* change made in large datasets.

To run with recovery off, enter the RECOVERY OFF command on the PDF EDIT screen. Since the new UTCS default is to turn recovery back on *each time* the PDF Edit panel is reentered, this command must be entered each time a fresh edit is started. Users experiencing problems with this should contact Advising Services at 978-HELP.

A.Nishri

What are VM and CMS?

One or two other articles in this issue of *COMPUTERNEWS* refer to VM and CMS. The purpose of this article is to explain these terms, since they are likely to appear more and more in the future.

VM (Virtual Machine) is an operating system that runs on IBM System/370 and similar computers. It provides each signed-on user with the impression that s/he has a complete computing system at his or her disposal. Since in practice it would be unreasonable to give every such user a separate system, VM provides each one with a "virtual" computing system and automatically arranges to share the real computing system among all the signed-on users.

The ability to share resources makes VM a good tool for systems programmers, because it allows them to test operating systems (including MVS and VM itself) without disrupting other VM-based work. UTCS started using VM in this capacity in the mid-1970s. VM allowed several systems programmers to share one test time slot productively. This productivity was instrumental in allowing us to quickly restore service to the university community when the computer centre was shut down by fire in 1977. UTCS has been running a production VM system for the last two years in support of BICS (Basic Instructional Computing Service), a tool for instruction in computing. It has also been available for the CADAM (Computer Aided Design and Manufacturing) package and facility used by

Mechanical Engineering, other selected research uses, system support, and, lately, networking (see "Announcing NetNorth" in this issue). Because the MVS systems group has used VM to do most of their development without disrupting the production MVS system, user access to MVS at all times of the day has been increased.

CMS is a timesharing system that runs on VM, much as TSO runs on MVS. The name originally stood for Cambridge Monitor System, because the original CMS system was developed at IBM's Cambridge Scientific Centre. Nowadays, we are told, the name stands for the Conversational Monitor System.

CMS has a number of features that make it suitable for use in an academic setting. It is simple to learn, yet very powerful; in addition, many software packages exist to augment the power of CMS. Easy-to-follow documents are available to get the user started on solving problems. A computer network connects many academic CMS sites, which makes sharing programs and data easier (see "Announcing NetNorth" elsewhere in this issue).

UTCS is currently conducting pilot projects to determine the potential additional usefulness of CMS here at U of T and will keep the university community informed of progress on these projects.

Michael Wagner

Call for Participants in a UTCS Pilot Project

For a while now, UTCS has been running a pilot project to determine how well research computing needs could be met by CMS (see preceding article). A group of research chemists has been using CMS on a regular basis to develop, test and run large FORTRAN programs. Feedback from individual participants indicates that CMS is meeting the group's needs well.

In the hope of showing that the success of CMS is not specific to that one group, we are now planning to open the pilot project to other research groups. Because of current resource constraints, we can propose service only to groups who meet the following criteria:

1. Must have minimal resource requirements during the day.
2. Must use calculation intensive rather than I/O intensive computing.

3. Must be able to work out problems that arise with little or no advisory support.
4. Must be able to compute with minimal access to tapes or other services requiring operator intervention.
5. Must have no software requirements beyond FORTRAN, PL/I, and PASCAL (MINITAB and SAS may also be possibilities).

If you feel that your group meets these criteria, please call Michael Wagner at 978-6602 to discuss the matter further. I will be away during part of August and September. If you call during my absence, Mary Ann Lawry may be consulted instead.

M. Wagner

GRYPE Facility Extends to TSO, WYLBUR, and GPJS

Users of the DECsystem-10 and UNIX services have been accustomed to the GRYPE facility for some time. Now it is also available from the TSO, WYLBUR and GPJS environments.

The facility allows users to issue suggestions which will be read and answered by a UTCS staff member. The answered suggestions are then made available for viewing by everyone.

The GRYPE part of this facility reads text entered by the user and records it in a reserved disk area.

To use this part:

TSO users type:	gripe
WYLBUR users type:	do gripe
DECsystem-10 users type:	r gripe
UNIX users type:	gripe
Batch users run:	//EXEC GRYPE

GRYPE automatically records the date, time, and jobname.

The GRIPA part of this facility allows users to see recent gripes and their answers. Note that the jobname is removed from the answer so that anonymity is preserved unless the user specifically enters identifying information in the text of the "gripe." GRIPA displays the answered gripes, most recently answered ones first.

For more information:

TSO type:	help gripe
WYLBUR type:	do gripe?
GPJS see file:	"SYS2.PROCLIB(GRIPE)"
DECsystem-10 type:	help gripe
UNIX type:	man gripe

continued...

GRIPE Facility continued

We hope users will find this additional channel of communication with UTCS useful. Those who have extensive comments

or who would prefer to speak to a UTCS staff member should contact Advising Services at 978-HELP.

A.Nishri

Class A Region Raised to 1500K

VS FORTRAN Release 1.3.1, available for users to test at UTCS, requires a region size greater than 1000K to process compiles of even a moderate size. We would like users running Release 1.3.1 to be able to run their jobs in Class A. Therefore, to aid our many FORTRAN users, as well as other users with jobs that could benefit from

such an increase, we are raising the region limit on Class A to 1500K.

If you have any questions, please contact Advising Services at 978-HELP.

Herb Kugel

TSO Running Unattended

To allow TSO users greater access to the system, TSO is now allowed to run unattended during the hours when there are no operators present. TSO will therefore be available unattended during weekends, excluding the hours of 10:00 a.m. - 6:00 p.m. on Saturdays and Sundays, when an operator will be present. TSO will also be available unattended during statutory holidays.

Although TSO is always attended Monday - Friday, it may not be available at all

between 6:00 - 8:00 and 22:00 - 24:00, the hours set aside for IBM systems maintenance. If maintenance is required, a broadcast message will appear shortly after 10:00 announcing downtime for that evening and/or the next morning.

If you have any question, please contact Advising Services at 978-HELP.

Herb Kugel

PL/I Release 4.0 Now the Production Default

PL/I Release 4.0 showed itself to be stable during the test period and became the production PL/I processor on July 4. Maintenance has been applied to the PL/I Release 4.0 libraries. Those using the PLIN procedures should now run their important jobs using these procedures and report any problems to 978-HELP. We would like to find and correct any difficulties as soon as

possible. Backup procedures have been created to access the Release 3.0 PL/I compiler should there be any specific difficulty.

If you have any questions, please contact Advising Services at 978-HELP.

Herb Kugel

PL/I(F) Procedures Removed

PL/I(F) was the original PL/I language processor. Dating from the early 1960s, it preceded both the PL/I Checkout and Optimizing compilers. Because UTCS statistics showed that UTCS PL/I(F) JCL procedures have seen no usage for well over two years, and because this level of the language is obsolete, we are removing the PL/I(F) procedures from the system. As there may still be the occasional load module that uses

PL/I (F), we will not touch the libraries containing this processor. However, any user with a PL/I(F) load module should be aware that this module is now completely unsupported.

Anyone with a PL/I(F) program should contact Advising Services at 978-HELP.

Herb Kugel

ALGOL F Removed

ALGOL F was originally installed on the UTCS IBM System sometime in 1966. A recent investigation showed that it has received no usage in over nineteen months. Moreover, the processor was not designed to work with IBM 3380 disk storage units.

Therefore, it was removed from the system at the end of May. This change in no way impacts ALGOL W, whose status has not changed.

Herb Kugel

Arts and Science Terminal (AST) Changes

As announced in our Annual Plan, UTCS is in the process of removing and/or replacing most of the "old technology" equipment during the 1984/85 fiscal year. Currently we have a total of seven IBM 029 keypunch machines and one TAB (interpreter) available in two locations -- The Arts and Science Terminal (AST) area, and the Engineering Annex Terminal (EAT) area.

During this summer, all four IBM 029 keypunch machines will be removed from AST. With the keypunches gone, there will

no longer be any real need for the card reader which is currently part of CDC Remote Job Entry (RJE) station. Because of the difficulties users have experienced with the AST printer, it has been recommended that the CDC RJE station be replaced by an upper- and lower- case printer.

In order to minimize the disruption of service at AST, these changes are scheduled for the last two weeks of August.

Vera Cabanus

1403 Print Setup at Central

This article describes the alignment settings for paper used in the IBM 1403 printer at destination CENTRAL. There are two aspects to the settings: the horizontal position (i.e., the margin) and the vertical position. The latter determines the location of the first available print line with respect to the top of the page.

inch (1.27 cm.) from the left edge of the paper.

On blank paper, the vertical position is set so that the first available space for printing is immediately below the perforation in the forms. On lined paper, the first available print space is immediately beneath the first green line.

Unless otherwise stated as part of the forms code, the horizontal position is set to 1/2

Bob Chambers

Hours of Service

The following hours of service are in effect for:

Civic Holiday

	August 4 (Saturday)	August 5 (Sunday)	August 6 (Monday)
3033/N12 GPJS (Classes B,E), Calcomp	10:00-18:00	10:00-18:00	closed
3033/N12 GPJS (Class A), WYLBUR, APL, TSO	10:00-18:00*	10:00-18:00*	unattended
DEC1090, 11/70	10:00-18:00*	unattended	unattended
BICS	unattended	unattended	unattended

* Running unattended outside these hours.
Normal hours of service for all systems will resume Tuesday, August 7, 1984.

Labour Day

	Sept. 1 (Saturday)	Sept. 2 (Sunday)	Sept. 3 (Monday)
3033/N12 GPJS (Classes B,E), Calcomp	10:00-18:00	10:00-18:00	closed
3033/N12 GPJS (Class A), WYLBUR, APL, TSO	10:00-18:00*	10:00-18:00*	unattended
DEC1090, 11/70	10:00-18:00*	unattended	unattended
BICS	unattended	unattended	unattended

* Running unattended outside these hours.
Normal hours of service for all systems will resume Tuesday, September, 4, 1984.

In the event of any changes to the above schedules, a notice will appear in HOTNEWS one week prior to the holiday.

Summer hours of service for the University of Toronto are 8:45 - 16:30 and will be in effect July 2 through August 31, 1984.

Change Committee

Changes To The IBM 3033/N12 System

1. Release 4.0 of PL/I was installed for testing on May 8.
2. RAQL was installed for internal testing on May 16. This product will provide a relational query language within the SAS environment.
3. The new ISPF was installed for production on June 11.
4. A new version of SCRIPT was installed on May 10. This version is available only in Batch. The old version is still the one invoked by TSO.
5. Release 2 of SPSS-X was installed for testing on June 11.

Changes To WYLBUR

1. Online documentation tools were installed on WYLBUR on June 5. EXEC files and CLISTS are available to review and/or print UTCS online documentation.
2. A new ALLOC EXEC file was installed in WYLBUR on June 4. This will simplify allocation methods for WYLBUR users.
3. The WNOTIFY step was added to the CONDENSE EXEC in WYLBUR on June 14. This change will inform users of the completion of a CONDENSE job.

Changes To TSO

1. As of June 9 TSO has been available during unattended hours on a test basis.
2. The TSO region size was increased to 1 meg on June 14. This was made necessary by requirements of the new version of ISPF.

3. Internal testing of PC-PLOT began on TSO on June 15. This product will allow an IBM PC to emulate a VT100 and to use Tektronix plotting commands supported by KIG.

Changes To SAS

1. SAS KIG drivers were upgraded on May 7.
2. SAS 82.4 was installed for production on June 11.

Changes to Other Systems and Services

1. The Physics terminal was permanently closed on May 10.
2. The ODS bit was removed from the accounting mechanism on May 16. This means that access codes will automatically have online storage authorization.
3. WSLIST was installed in public library 4 on APL on May 24. As a replacement for DOCWS it will make use of HSPRINT.
4. As of July 1, all highspeed printing on the IBM 3033/N12 system will be charged on a per page basis, rather than on a per line basis.
5. Limits on spool job length on the PDP-11/70 were removed on May 28.
6. EUNICE was installed on the HUB VAX on May 26. This will provide a UNIX environment under VMS to support networking software.
7. TCP/IP was installed on the HUB VAX. This product will provide a mechanism for high performance file transfers between UNIX sites.
8. The GRIPE facility used on the DECsystem-10 has been extended to TSO, WYLBUR, and GPJS. This facil-

continued...

TSO - gripe/gripa
WYLBUR - DO gripe/DO gripa
GPJS - //EXEC GRIPE.

New UTCS Documents

UTCS Guide to GPJS (MANUAL=GPJSX)

Personnel Changes

The creation of the Microcomputer Support Group (MSG) has given rise to a number of promotions and changes within UTCS. **Paul Roth** is now Supervisor of the Microcomputer Support Group. **Alex Nishri** became Supervisor of the Applications Support and Advising Group (ASA). **Terry Jones** accepted the position of Supervisor of the Central Advising Office (CAO). Congratulations!

Regretfully, UTCS lost its Micro Specialist, **Grant Davis**, who has moved into industry. We wish you the best, Grant. Two new microcomputer specialists in the MSG are: **Willard McCarty** and **Gregory Stopelli**. Willard joined UTCS in June, specializing in microcomputer database products, e.g. dBaseII. Gregory has just recently assumed Grant Davis's responsibilities. We at UTCS extend our warmest welcome to both of you.

A number of other promotions have also

occurred over the past couple of months. **Allen Ng**, formerly in the Text Group, has accepted a position in the Systems Group, and **Mary Ann Lawry**, UTCS's APL Specialist for the last 4 years, has taken a position in the Systems Group as well.

Dawne Smith, Technical Writer and Instructor for the Text Group, has left UTCS to relocate near Kingston. She is now also the mother of a beautiful baby girl. Congratulations on your new addition; we will miss you.

Patricia Hood has taken on the responsibility as Technical Writer and Instructor for the Text Group. Pat was a Waterloo Coop Student, formerly working in the Publications Group at UTCS.

Elizabeth Weitmann

Recent Acquisitions in the Computer Science Library

ACM Symposium on Principles of Programming Languages, 11th, Salt Lake City, Utah, Jan. 1984. Conference record.

ACM Symposium on Theory of Computing, 16th, Washington, May 1984. Proceedings. New York, ACM, 1984.

Association for Computing Machinery. ACM guide to computing literature. 1981.

Clinic on Library Applications of Data Processing, 19th, University of Illinois, Apr. 1982. Library automation as a source of management information.

Cohen, Jacob Willem, and Boxma, O.J. Boundary value problems in queueing system analysis, Amsterdam, North-Holland, 1983.

Cooper, Robert B. Introduction to queueing theory. 2nd ed. New York, North-Holland, 1981.

Evans, David J., ed. Preconditioning methods: analysis and applications. New York, Gordon and Breach, 1983.

Golub, Gene Howard and Van Loan, C.F. Matrix computations. Baltimore, Md., Johns Hopkins University Press, 1983.

continued...

Computer Science Library continued

IFIP World Computer Congress, 9th Paris,
Sept. 1983.

Information processing 83.
Amsterdam, North-Holland, 1983.

Johnson, Lee W. and Riess, R.D.
Numerical analysis. 2d ed.
Reading, Mass., Addison-Wesley, 1982.

King, Margaret, ed.
Parsing natural language.
London, Academic Press, 1983.

Loomis, Mary E.S.
Data management and file processing.
Englewood Cliffs, N.J., Prentice-Hall, 1983.

Piessens, Robert et al.
QUADPACK: a subroutine package for
automatic integration.
Berlin, Springer-Verlag, 1983.

Ryan, Daniel L.
Computer-aided architectural graphics.
New York, Marcel Dekker, 1983.

Schmidt, Richard A.
Motor control and learning: a behavioral
emphasis.
Champaign, Ill., Human Kinetics Publishers,
1982.

Van Melle, William James.
System aids in constructing consultation
programs.
Ann Arbor, Mich., UMI Research Press, 1981.

Winston, Patrick Henry.
Artificial intelligence. 2d. ed.
Reading, Mass., Addison-Wesley, 1984.

Yugoslav Seminar on Graph Theory,
4th, Novi Sad, April 1983.
Graph theory.
Novi Sad, University, 1984.

Stephanie Johnston

Technical Reports Recently Received in the Computer Library

Carnegie-Mellon University (Robotics Institute)

- | | |
|--------------|--|
| Hall, D.J. | - Robotic sensing devices. Mar, 1984. 83 p. (84-3). |
| Thorpe, C.E. | - Path relaxation: path planning for a mobile robot.
Apr. 1984. 20 p. (84-5). |

University of Illinois

- | | |
|----------------|---|
| Markt, D.E. | - Study of file migration strategies. May 1984.
67 p. (84-1167). |
| Peterson, J.S. | - Automatic file migration, Apr. 1984. 90 p. (84-1166). |

University of Montreal

- | | |
|-------------------|--|
| Cerny, E., et al. | - Experiments in testing communication protocol
implementations. Nov. 1983. 19 p. (#492). |
| Gecsei, J. | - User-interactive teletext. Mar. 1984. 35 p. (#506). |

continued...

Technical Reports continued**University of Newcastle upon Tyne**

- Campbell, R.H. & Randell, B. - Error recovery in asynchronous systems.
June 1983. 36 p. (#186).
Lauer, P.E. - Computer system dossiers. June 1983. 52 p. (#185).

Rutgers University

- Borgida, A. - Features of languages for the development of information
systems at the conceptual level.
Dec. 1983. 35 p. (LCSR-TR-52).
Epstein, S.L. - Knowledge representation in mathematics: a case
study in graph theory. 279 p. 1983 (DCS-TR-134).

Stanford University

- Knuth, D.E. & Weening, J.S. - A programming and problem-solving seminar.
Dec. 1983. 91 p. (83-989).
Ullman, J.D. - Some thoughts about supercomputer organization.
Oct. 1983. 17 p. (83-987)

XEROX Corp.

- Birrell, A.D. & Nelson, B.J. - Implementing remote procedure calls.
Dec. 1983. 22 p. (CSL-83-7).

Stephanie Johnston

Consulting and Enquiries

Advising Supervisor	Terry Jones	MP345	4757
External Marketing Consultant	Ihor Prociuk	MP350	6875
Erindale College	Peter Wall	2043	828-5311
Scarborough College	William Barek	S626	284-3173

General Enquiries	Dale Wright	EA206	4990
Account & Access Code Enquiries (U of T)	Agatha Stevens	MP337	8703
Account & Access Code Enquiries (External)	Sylvia May	MP337	7148
Tape Library (Academic Services)	Stella Martin	MP368	7319
Tape Library (Administrative Services)	Miranda Fong	MP368	6693
U of T Computer Library	Stephanie Johnston	EA206	2987

Central Advising Office (Appointments)	HELP	300 Baud Interactive Services	6200
Central Advising Office (Phone-in)	HELP	1200 Baud Interactive Services	3959
Microcomputer Support Group	5071	DATAPAC	4320, 0056
System Status Enquiries (DEC)	4318	Telenet	0302043200056
System Status Enquiries (IBM)	7393	Tymnet	<backspace> DPAC;302043200056

UTCS Directory

Director	Dr. Warren Jackson	MP350	8948
Associate Director	Eugene Siciunas	MP350	5058
Senior Budget Analyst	Sheila Brown	MP350	8697

Managers

Communications & Technical Support	Norman Housley	SF4306	4967
Internal Systems & Administration	TBA		
Operations	Dr. Bob Chambers	MP350	7092
Systems	Bill Lauriston	MP331	3579
User Interface	Don Gibson	MP350	7331

Committees on Computing

UTCS Board	Chairman	Prof. D.M. Nowlan	4984
BICS Steering Committee	Chairman	Prof. R.C. Holt	8726
Committee on Academic Computing	Chairman	Prof. J.Z. Buchwald	7391
Committee on Computer Networks & Telecommunications	Chairman	Mr. A. Heyworth	4936
Committee on Computing Facilities & Services	Chairman	Prof. J.D. Bossons	8626
Computing Disciplines Facility	Chairman	Prof. E.C.R. Hehner	6026
LIBRA Steering Committee	Chairman	Prof. G.S. Graham	6321
Natural Language Processing Steering Committee	Chairman	Prof. I. Lancashire	828-5273
UTCS Users' Committee	Chairman	Prof. J.C. Hurd	3056
	Secretary	Ms. C. Pereira	4463

UTCS Terminal and Advising Sites

Names and Locations

- Central Advising Office (CAO), 978-HELP
- Education Facility (Educ), McLennan Labs, 60 St. George St., Room 221
- Engineering Annex (EAT, EUT, CDF), 11 King's College Road, Rooms 103, 104, 107, 201, 203.
- Erindale College (Erin), 828-5339, Mississauga Road, Erindale Campus, Rooms 2005, 2039, 2045
- Robarts, Robarts Library, 130 St. George St., Room 1061A
- Scarborough College (Scar), 284-3122, Military Trail, Scarborough Campus, Room S624, S625, S627, S628, S628A
- Sidney Smith (AST & ASUT), 100 St. George St., Rooms 1071, 1073, 2105
- St.Michael's College, 121 St. Joseph St., Room 101
- Trinity College, 6 Hoskins Ave., Room 024
- Victoria University, 73 Queens Park Cres., Room 012.

Sites	Hours of Operation				Restrictions*	Advising
	Mon-Thurs	Fri	Sat	Sun		
AST	8:00-22:00	8:00-22:00	8:00-22:00	8:00-22:00	Research	978-HELP
ASUT	7:00-24:00	7:00-24:00	7:00-24:00	7:00-24:00	BICS	No
CAO	10:00-18:00	10:00-18:00	closed	closed	Research	978-HELP
CDF	24 hrs	24 hrs	24 hrs	24 hrs	Res/Under	No
EAT	24 hrs	24 hrs	24 hrs	24 hrs	Research	978-HELP
Educ	24 hrs†	24 hrs†	24 hrs†	24 hrs†	Research**	978-HELP
(outer)	24 hrs†	24 hrs†	24 hrs†	24 hrs†	Research	978-HELP
Erin (2039)	9:00-17:00	9:00-17:00	24 hrs	24 hrs	Research	Rm 2005
(2045)	24 hrs	9:00-17:00	24 hrs	24 hrs	Undergrads	Rm 2005
EUT	24 hrs	24 hrs	24 hrs	24 hrs	BICS	No
Robarts	8:30-23:00	8:30-18:00	9:00-17:00	closed	BICS	No
Scar	9:00-24:00	9:00-24:00	10:00-17:00	closed	Research	Rm S624, S626
					Undergrads	Rm S624
St.Michael's	closed	closed	closed	closed	BICS	Arranged by College
Trinity	8:00-17:00	8:00-17:00	closed	closed	BICS	Arranged by College
Victoria	closed	closed	closed	closed	BICS	Arranged by College

* Research includes graduates, faculty, staff. ** May be unavailable due to UTCS courses.
† Building open Mon. - Thurs. 7:00 - 22:00, Fri. 7:00 - 17:00, Building closed Sat. & Sun.

Advising Hours

CAO Monday to Friday, 10:00 - 18:00 Erin, Scar During normal hours

Services Available
(Y=yes, N=no)

	BICS	Keypunch	PACX	Printers	Oracle	UNIX
AST	N	Y	Y	Y	N	N
ASUT	Y	N	N	Y	Y	N
CDF	N	N	N	Y	N	Y
EAT	N	Y	Y	Y	N	N
EUT	Y	N	N	Y	Y	Y
Educ	N	N	Y	N	N	N
Erin	N	N	Y	Y	N	Y
Robarts	Y	N	N	Y	Y	N
Scar	N	N	Y	Y	N	Y
St.Michael's	Y	N	N	Y	Y	N
Trinity	Y	N	N	Y	N	N
Victoria	Y	N	N	Y	N	N

UTCS Systems

3033/N12 Processor

- located in McLennan Physical Laboratories
- provides General Purpose Job Stream, TSO, WYLBUR, APL
- 12 megabytes of memory
- MVS with JES2

3033/U16 Processor

- located in McLennan Physical Laboratories
- provides instructional access using BICS
- 16 megabytes of memory
- UTS (modified UNIX Seventh Edition) under VM/370

4341 Mod II Processor

- located in McLennan Physical Laboratories
- provides administrative IMS/VS, DB/DC, Batch and TSO
- 16 megabytes of memory
- MVS with JES2

DECsystem-10 Model 1090

- located in McLennan Physical Laboratories
- provides General Purpose Time-Sharing
- 512 K - 36 bit words of memory
- TOPS-10 operating system, version 7.02
- GALAXY queuing, spooling, and batch subsystem, Version 4.1

PDP-11/70 SAS/DPS UNIX

- located in McLennan Physical Laboratories
- provides UNIX text processing & Statistical Analysis Service (Dept. of Statistics)
- 4 megabytes of memory
- typesetting hardware (CAT/8) and Varian for previewing typeset output
- UNIX Seventh Edition

VAX-11/750

- located in McLennan Physical Laboratories
- provides backup, program testing, and intercommunication relating to student services
- 3 megabytes of memory
- VMS

Computer Disciplines Facility

VAX-11/750 (4 megabytes of memory)
 VAX-11/750 (2 megabytes of memory)
 VAX-11/780 (4 megabytes of memory)

- located in Engineering Annex
- provide Computer Science interactive access
- UNIX (Berkeley Unix 4.2BSD)

Communications & Technical Support

- located in Sandford Fleming Building, Fourth Floor
- Communications Group provides communications systems, terminals, modems, data channels: consulting and installation.
- Field Service Group installs and maintains small computer systems on a contract basis or on a cost-per-call basis.
- provides consulting on minicomputers; configures and installs minicomputer systems

Microcomputer Facility

- located in McLennan Physical Laboratories
- provides consulting on microcomputer systems
- offers media conversion services
- Machines include:
 IBM Personal Computer & PC/XT, APPLE II Plus, Macintosh, TRS-80 Model 1, S-100 CP/M System, Osborne Micro, plus a variety of others on loan from suppliers

Scarborough College Systems

VAX-11/750 (2 megabytes of memory)

- provides instructional access using VMS

VAX-11/750 (5 megabytes of memory)

- provides instructional access using UNIX (Berkeley Unix 4.2BSD)

Erindale College Systems

VAX-11/780 (4 megabytes of memory)

- provides instructional access using VMS
- Research access

VAX-11/750 (5 megabytes of memory)

- provides instructional access using UNIX (Berkeley Unix 4.2BSD)

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